

Operating
information

DN3601

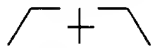
**PROGRAMMABLE SLAVE
GRAPHIC EQUALISER**

Software Version 2.0



**Audio engineering
like no other
in the world**

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THANK YOU FOR USING THIS KLARK TEKNIK PRODUCT

To obtain maximum performance from this precision electronic product, please study these instructions carefully. Installation and operating the DN3601 is not complicated, but the flexibility provided by its operating features merits familiarisation with its controls and connections. This unit has been prepared to comply with the power requirements that exist in your location.

Precautions

Before connecting the unit to the mains power, ensure that the operating voltage is correct for your local supply. Operating voltage is indicated by an adhesive label on the rear panel.

Do not install this unit in a location subjected to excessive heat, dust or mechanical vibrations.

Power Connection

Connection is made by means of an IEC standard power socket.

Before connecting this unit to the mains supply, ensure that the fuse fitted is the correct type and rating, as indicated on the rear panel, adjacent to the fuse holder.

To change the mains voltage please refer to "Service" section. Mains voltage change should be carried out by a qualified service technician only.

Safety Warning

This unit is fitted with 3-pin power socket. For safety reasons the earth lead should not be disconnected. If you encounter a problem with earth-loops, remove the ground-lift link located inside the unit to isolate the signal earth from the chassis earth (see Service section for details).

This should be carried out by a qualified service technician only.

To prevent shock or fire hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not remove covers. Dangerous voltages exist inside. Refer servicing to qualified personnel only.

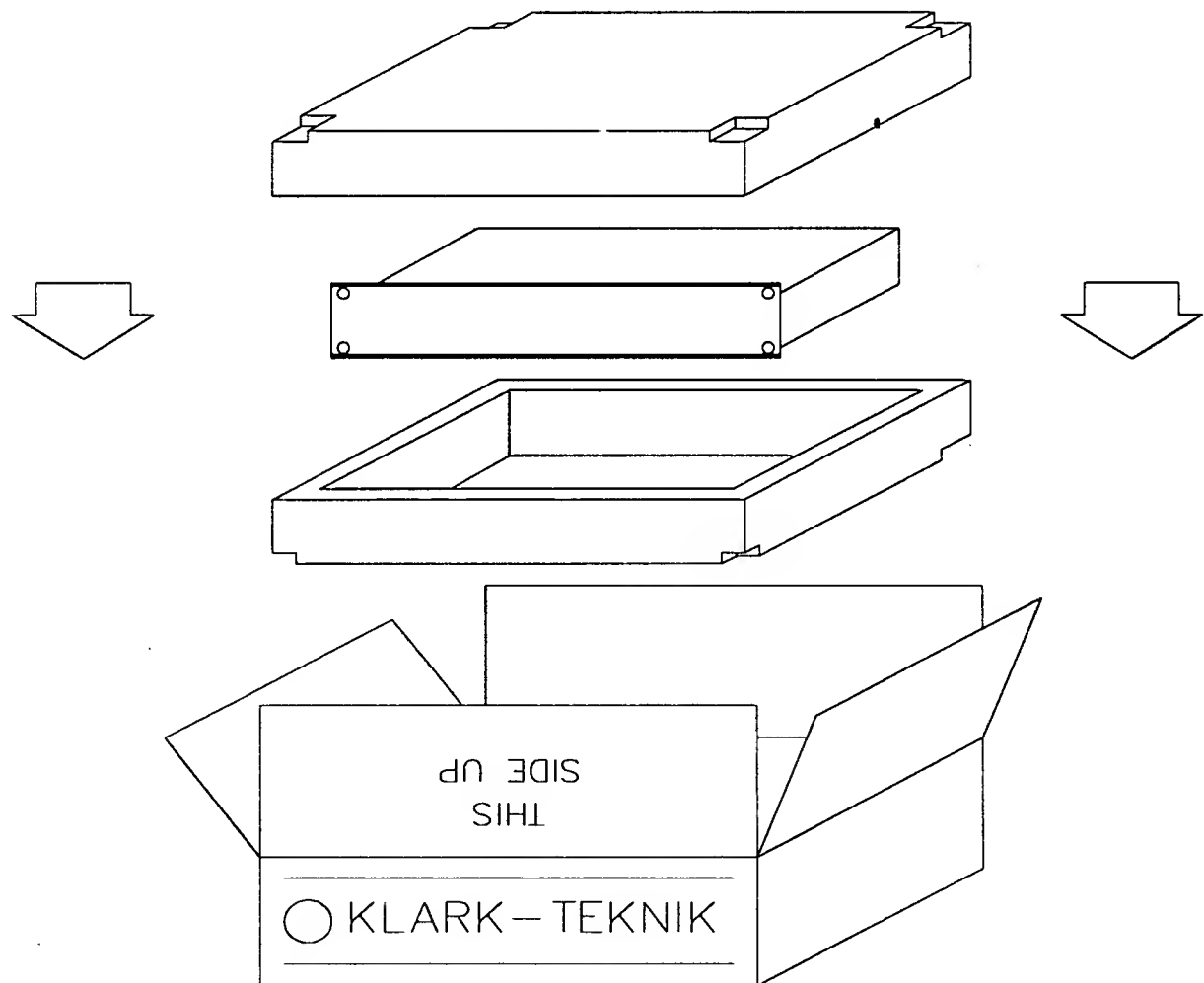
After you have unpacked the unit

Save all the packing materials - they will prove valuable should it become necessary to transport or ship this product.

Please inspect this unit carefully for any signs of damage incurred during transportation. It has undergone stringent quality control inspection and tests prior to packing and left the factory in perfect condition.

If, however, the unit shows any signs of damage, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for damage during transportation.

If necessary, contact your supplier or as a last resort, your Klark Teknik importing agent, who will fully co-operate under such circumstances.



INTRODUCTION

Designed to meet and exceed the needs of the recording, broadcast, installation and live sound industries, the Klark Teknik DN 3601 Programmable Slave Graphic Equaliser is an extremely high quality, digitally controlled, two-channel, third-octave equaliser that offers state-of-the-art audio performance in a remote controlable, tamper-proof, cost effective package. The two channels may either be used independently or linked for stereo use. To further extend the flexibility of the equaliser, the unit also incorporates variable frequency low and high-pass filters, two notch filters with variable frequency and depth and overall gain adjustment on each channel.

Being the 'slave' derivative of the Klark Teknik model DN3600, the DN3601 front panel features only twin signal strength meters, clip LEDs, an LED numerical display and a power switch. The unit can be controlled by a master DN3600 unit or by a suitably equipped computer or other MIDI control device. Up to 64 DN3601 units (or mixed DN3600s and DN3601s) may be linked in a single MIDI loop via the Pro MIDI Interface on the rear panel. The DN3601 may store up to 66 equaliser programs in its own, internal memory and can then take full advantage of the extensive user interface of the controlling device. A 16-pin connector is provided on the DN3600 for use in conjunction with the DN60 Real Time Spectrum Analyser enabling room analysis and equalisation to be accomplished automatically.

An extensive equalisation system can be created with central, user friendly control. Slave units may be addressed individually or globally by the master, and will also respond to standard MIDI program change commands.

The proprietary analogue filters are based around the Klark Teknik "MELT" hybrid filter circuits which offer far greater headroom and dynamic range than is possible using 18-bit linear, digital systems. Benefiting from revised circuitry, these filters are exceptionally reliable and offer greater stability than discrete designs. They are also relatively immune to electromagnetic interference, unlike coil-based filters. Separate supply rails are used for the digital and analogue circuitry which, in combination with rigorous internal screening, ensures the cleanest possible audio signal path.

In order to provide maximum operational flexibility, the system includes a switchable Q mode. The Low Q setting (Q:360) provides an accurate emulation of the industry-standard DN360 equaliser. In High Q mode (Q:27), the performance emulates the DN27.

To maintain the optimum signal to noise ratio and headroom at all equaliser settings, the gain control acts on the equaliser sections themselves rather than being a simple pre or post-equalisation gain stage. Additionally, an Auto gain mode is included in the system which automatically scales the gain of the individual equaliser bands as cut or boost is applied to reduce the risk of accidental clipping and to maintain a safe working headroom.

Both the input and output circuitry is electronically balanced with a nominal operating level of +4dBu. The output circuitry is based on the Midas XL3 output stage, giving exceptionally high drive capability. A transformer option is available for both inputs and outputs.

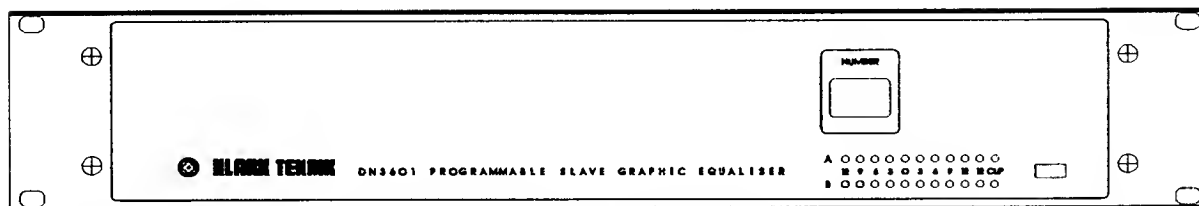
Installation

The inputs and outputs are fully balanced on XLR connectors and are wired conventionally with pin 1 as ground. Because the system is fully floating, either pin 2 or pin 3 can be designated as hot so long as the same protocol is adhered to for both the input and the output connectors.

The DN3601 is designed for use in both fixed and mobile installations where it can be mounted in a conventional 19 inch rack occupying just 2U of height. In mobile situations where rough handling is a possibility, it is advisable to support the rear of the unit to prevent undue stress being placed on the front panel. Ensure that the unit has sufficient ventilation and that it is not placed directly over any device which runs hot such as a power amplifier or console power supply.

Instrument Familiarisation

Front panel functions



NUMERIC WINDOW: Displays the address number of the Slave and flashes on and off when the unit is being addressed by an external controller, such as a DN3600.

METERS: Separate 10-segment bargraph level meters monitor the signal level in channels A and B over the range -12dB to +15dB. The Clip warning LED monitors seven different points within the circuitry of the DN3601 and flashes if the level at any point comes within 2dB of clipping.

POWER SWITCH: Switches the unit on and off. When the unit is off, there is a hard relay bypass which connects the input signal directly to the output.

Rear Panel Functions

Balanced Input XLR Sockets

Balanced Output XLR Sockets

Pro MIDI XLR Connectors: These follow the same wiring convention as conventional MIDI DIN sockets. These are used for performing system exclusive data transfer and for linking multiple units in a master/slave configuration. See service section for wiring convention.

Voltage Selector Switch: selects between 120v and 240v operation.

IEC Mains Socket.

MASTER/SLAVE OPERATION

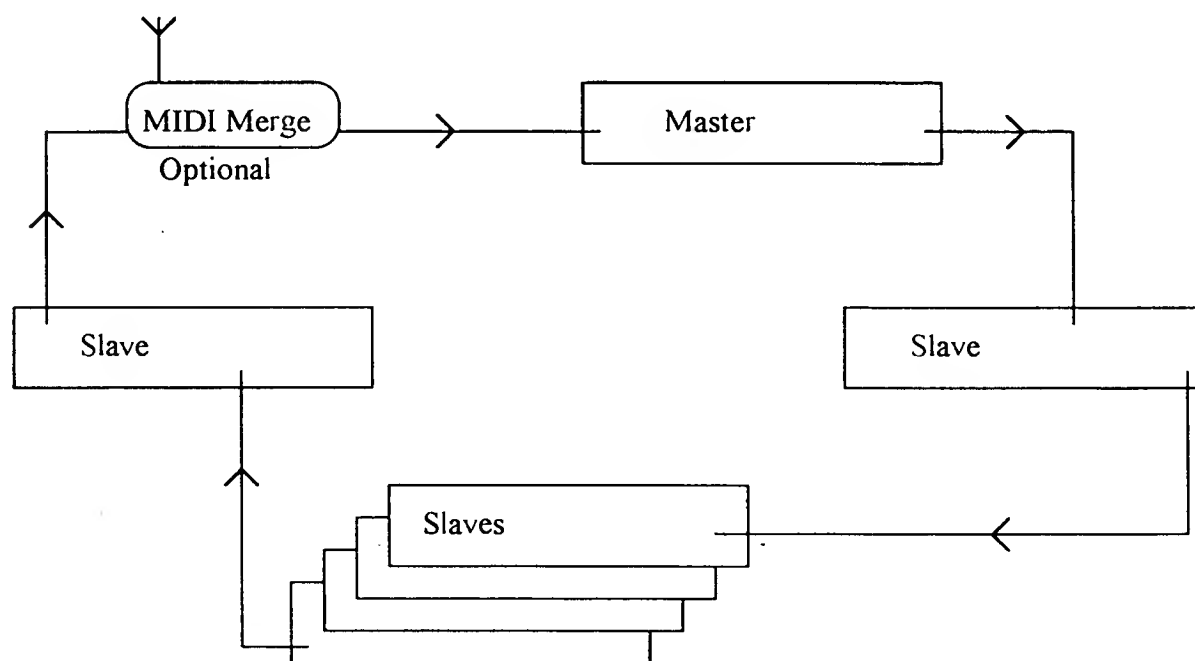
The Klark Teknik Pro MIDI Master/Slave system allows up to 65 DN3601 and DN3600 units to be operated, either individually or together, from the front panel of a single DN3600 or a suitably equipped computer. The system is simple to connect, simple to operate and protects itself from the dangers of unreliable power supply and damaged connections.

Once programmed, the equaliser program memories resident in the DN3601 Slaves may be selected via ordinary MIDI program change commands without the need for a DN3600 master unit. This provides an economical way of managing a large installation as the slave system is both cost effective and secure from inadvertent tampering.

Connections.

For remote control of all parameters, any DN3601, DN3600 and computer devices must be linked in a closed loop via their Pro MIDI interfaces - MIDI OUT to MIDI IN. Master/Slave configuration is automatic when two or more DN3600 and/or DN3601 units linked in this way. Remote control is via "system exclusive" messages.

Note: The loop must be closed. Each MIDI OUT must be connected to the next MIDI IN. If MIDI program change messages from some other device are to be injected onto the Klark Teknik loop, this must be done via a MIDI MERGE unit.



Any DN3600 in the loop can be designated as the Master by entering the Slaves sub menu (press **Utilities, More..., Slaves** on the DN3600). The other DN3601 and DN3600 units in the loop will automatically configure themselves as slaves, with the first being number 1, the second being number 2 and so on. Each slave will display its number on its own front panel LED display. A maximum of 64 units may be connected in this way (65 including the Master).

To address an individual DN3601 Slave, enter the Slaves sub-menu of the Master DN3600 unit. The slave address number can now be changed using the **FREQ** or **LEVEL** rotary controls. Press the Slaves soft key a second time to initiate control of the selected device.

All the controls and display modes now affect only the selected DN3601 Slave unit. The number of the selected Slave is displayed as highlighted text at the top of the LCD screen. The address number on the front panel LED of the DN3601 will flash on and off. Only the Slaves and Lock sub menus relate to the Master unit. To address another slave, enter the Slaves sub menu and select a new slave number.

To address all the Slaves in the loop, enter the Slaves sub menu and select **SELECT ALL**. All functions and controls now affect all units including the Master. For example, performing an Auto EQ function now will adjust all the units in the loop to equalise the spectrum of a DN60 connected to the master.

To return to normal operation, ie adjustment of the Master itself, the Slaves selection must be returned to “**STAND ALONE**”. The slave units will retain their current settings until changed. All controls and display modes now affect only the Master unit.

Note: A MIDI loop can only have one Master. Initiation of another master by entering its Slaves menu will cancel the original master and renumber the loop.

Program Changes.

DN3601 Slaves (and DN3600s) will respond to standard MIDI program change messages without the need for a DN3600 master unit or a closed loop. Just feed the MIDI signals into the MIDI IN socket. All MIDI messages will be copied through to the MIDI OUT socket.

A system such as this offers benefits of reduced cost and inherent tamper proof security. As well as real time operation from a central control position, a network of equalisers may be loaded with the memories necessary for various tasks and then, with the master unit removed, will respond only to program changes.

DETAILS OF OPERATION

Being a description of the features and functions accessible via a DN3600 master unit with version 2.0 software.

Initial, Default Display

Soft key options: **More EQ**

A : B : Link

Utilities

Bypass

Fader adjustment

The 'Virtual' Graphic Equaliser faders are selected either by pressing the appropriate frequency key or by rotation of the **FREQ** rotary control.

There are several ways to select a range of adjacent faders.

1. Hold a single Frequency key until it starts to flash. This sets one end of the range. Define the other end of the range by pressing a second Frequency key, or by use of the **FREQ** rotary control. The selected fader or faders becomes highlighted.
2. Press two Frequency keys at the same time.
3. Press two Frequency keys in quick succession.

The frequency or frequency range of the selected fader or faders is shown in text at the top of the screen.

The selected fader or faders are adjusted by use of the **LEVEL** rotary control. The adjustment range is +/-12dB in half dB steps. The fader level or, in the case of a range of faders, the average fader level, is shown as text at the top of the screen.

Also shown at the top of the screen are current Memory name, Q-mode and Channel being addressed.

Gain Adjustment

Pressing the **GAIN** key at any time toggles between gain adjustment and fader adjustment. When gain adjustment is selected, the gain fader is highlighted. Gain may be adjusted by use of the **LEVEL** rotary control.

The range of adjustment is +6 to -18dB in half dB steps. Below -18 the unit is muted. While in Gain Adjust mode, the gain setting is shown in text at the top of the screen. Mute status is shown by a **Muted** icon at the top of the screen.

CURVE/FADER

The **CURVE/FADER** key toggles the screen between Curve and Fader displays. While the Fader display shows the positions of the 30 Graphic faders for the addressed channel, Curve display calculates the actual frequency response of the unit, taking into account fader positions, filter Q and interaction, low and high pass filters, notches and gain. Graphic faders can be selected and adjusted while viewing the Curve display, which changes to show the adjustments in real time.

More EQ

Soft key 1 is accompanied by the text **More EQ**. Pressing this key selects the More EQ menu and the Filter Adjust display. See below.

A : B : Link

Soft key 2 is accompanied by the text **A : B : Link**. Pressing this key toggles between addressing channels A and B. If the key is held for more than 1 second, the Link mode is selected. In Link mode, all fader adjustments affect both channels. If Link mode is entered from channel A, channel A is displayed and channel B follows it. If Link mode is entered from channel B, channel B is displayed, and channel A follows. The A : B : Link status is shown at the top of the screen as **=A=**, **=B=**, **A+B** or **B+A**.

Utilities

Soft key 3 is accompanied by the text **Utilities**. Pressing this key selects the Utilities menu. See below.

Bypass and Reset

Soft key 4 is accompanied by the text **Bypass**. Pressing this key engages a bypass of the graphic equaliser section. The Gain control and More EQ filters and Notches remain in circuit. If the **Bypass** key is held pressed for more than 5 seconds, all the graphic faders of the addressed channel are reset to the 0dB position.

More EQ Menu and Display.

Accessed by pressing the **More EQ** key from the Start-up menu.

Soft key options: **Filters**

A : B

In/Out

Exit

More EQ Display

In **MoreEQ** mode, the display shows the frequency response curve calculated from the Notch filter and High Pass and Low Pass filter settings.

CURVE/FADER

When the **CURVE/FADER** key is pressed, the display incorporates the Graphic fader positions into the calculated frequency response curve.

Filters

Soft key 1 is accompanied by the text **Filters**. Pressing this key selects Filter Adjust mode. See below.

A : B

Soft key 2 is accompanied by the text **A : B**. When pressed, the key toggles between adjustment of the Filters and Notches of channel A and those of channel B.

The channel **A : B** status is shown in text at the top of the screen.

In/Out

Soft key 3 is accompanied by the text **In/Out**. When pressed, the High and Low pass filters and two Notch filters are switched in or out of circuit. The **In/Out** status is highlighted on the menu. When the filters are out of circuit, the **Filters** key is disabled and the display shows a flat frequency response.

Exit

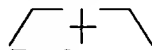
Soft key 4 is accompanied by the text **Exit**. When pressed, the key returns the unit to the start up display and menu.

Filter Adjust Menu and Display.

Access by pressing the **More EQ** key followed by the **Filters** key.

Soft key options: **Notch 1**

Notch 2


Back

Display

In Filter adjust mode, the display shows the frequency response curve calculated from the Notch filter and High Pass and Low Pass filter settings.

CURVE/FADER

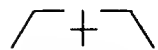
When the **CURVE/FADER** key is pressed, the display incorporates the graphic fader positions into the calculated frequency response curve.

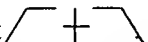
Notch 1

Soft key 1 is accompanied by the text **Notch 1**. When pressed and highlighted, the key selects Notch filter 1 for adjustment. The Notch filter frequency is set by use of the Frequency keys (1/3 octave ISO frequencies) or by the **FREQ** rotary control (1/12 octave steps). Notch frequency is shown as text at the top of the screen. Notch filter depth is adjusted by the **LEVEL** rotary control over a range of 0 to -12dB in 1dB steps. Notch depth is shown as text at the top of the screen.

Notch 2

Soft key 2 is accompanied by the text **Notch 2**. When pressed and highlighted, the key selects Notch filter 2 for adjustment. The Notch filter frequency is set by use of the frequency keys (1/3 octave ISO frequencies) or by the **FREQ** rotary control (1/12 octave steps). Notch frequency is shown as text at the top of the screen. Notch filter depth is adjusted by the **LEVEL** rotary control over a range of 0 to -12dB in 1dB steps. Notch depth is shown as text at the top of the screen.



Soft key 3 is accompanied by the text . When pressed and highlighted this key selects the High and Low pass filters for adjustment. The High pass filter frequency is set by the frequency keys or by the **FREQ** rotary control. The Low pass filter frequency is set by the frequency keys or by the **LEVEL** rotary control. High and Low pass filter frequencies are shown as text at the top of the screen.

Back

Soft key 4 is accompanied by the text **Back**. When pressed, this key returns the unit to the More EQ menu.

Utilities menu.

Accessed by pressing the **Utilities** key from the Start-up menu.

Soft key options: **Auto/Q**

Memory

More. . .

Exit

Auto/Q

Soft key 1 is accompanied by the text **Auto/Q**. When pressed, this key selects the **Auto/Q** menu. See below.

Memory

Soft key 2 is accompanied by the text **Memory**. When pressed, this key selects the Memory/Lock menu. See below.

More. . .

Soft key 3 is accompanied by the text **More. . .**, meaning “More Utilities”. When pressed, this key selects the MIDI channel, Slave selection and LCD invert facilities. See below.

Exit

Soft key 4 is accompanied by the text **Exit**. When pressed, this key returns the unit to the Start up menu.

Auto/Q menu.

Accessed by pressing the **Utilities** key followed by the **Auto/Q** key.

Soft key options: **Auto Gain**

Auto EQ

'Q' type

Exit

Auto Gain

Soft key 1 is accompanied by the text **Auto Gain**. When pressed, this key toggles the Auto Gain function on or off. When Auto Gain is on, the Gain fader will move automatically to compensate for any further adjustments made to the graphic faders in order to maintain unity gain for an 'average' audio signal.

Auto EQ

Soft key 2 is accompanied by the text **Auto EQ**. This function is used when the DN3600 is connected to a Klark Teknik model DN60 Real Time Spectrum Analyser via their respective "DN60 Interface" and "Plotter Interface" ports.

When the key is pressed, the DN3600 reads the frequency spectrum as displayed at that moment by the DN60 analyser. Fader adjustments are then applied to the selected channel (A, B or - in LINK mode - both) to compensate for the analysed room or system response.

Q Type

Soft key 3 is accompanied by the text **Q Type**. When the key is pressed, the addressed channel toggles between the Q modes: 360 and 27. The Q mode is shown as text at the top of the screen. The Q mode determines the shape, and hence the sound and interaction, of the graphic filters.

Q:360 emulates the wide and hence smoothly combining and easy to use filters of the industry standard Klark Teknik DN360 Graphic Equaliser. **Q:27** emulates the narrower and hence less interactive LCR filters of the older Klark Teknik model DN27 Graphic Equaliser.

Exit

Soft key 4 is accompanied by the text **Exit**. When this key is pressed, the unit returns to the start up menu.

Memory/Lockout menu

Accessed by pressing the **Utilities** key followed by the **Memory** key.

Soft key options: **Recall**

Save

Lock

Exit

Recall

Soft key 1 is accompanied by the text **Recall**. This key allows any of the 66 named memories to be recalled. To recall a memory:

1. Press the **Recall** key once.
2. The **NUMBER** window shows the selected memory number while the LCD shows the memory name and fader positions. Select the required memory by name and/or number by use of the **FREQ** or **LEVEL** rotary control.
3. The procedure may be aborted at any time by pressing the **Exit**, **Lock** or **Save** keys.
4. Press the **Recall** key once more. At this point all the fader, filter, Q and Gain settings are updated.

The current memory name is shown as text at the top of the screen. The current memory number is shown in the **NUMBER** window unless any manual changes are made.

Save

Soft key 2 is accompanied by the text **Save**. This key allows the current equaliser settings to be stored in any of the 66 memory locations. Each memory may be given an 8 character name. To Save a memory:

1. Press the **Save** key once.
2. Select the memory number by use of the **FREQ** or **LEVEL** rotary control. Memory number is shown in the **NUMBER** window. Memory name - if any - is shown on the LCD.
3. If desired, enter a new memory name or edit the old memory name using the Frequency keys. These correspond to the letters A to Z. By pressing the **SHIFT** key, the numbers 0 to 9 may also be accessed. The < key is a backspace or delete function.
4. The procedure may be aborted at any time by pressing the **Exit**, **Lock** or **Recall** keys.
5. Press the **Save** key a second time.

All fader, filter, Q and gain data for both channels is saved in a memory. The current memory name is shown as text at the top of the screen.

Lock

Soft key 3 is accompanied by the text **Lock**. This key allows access to the two lock modes. When the key is pressed, the menu options change to:

Full

Partial

Exit

Full

Full lock prevents access to all controls. After Full Lock has been set, the only action possible is to press the **Unlock** key and type in a password. If the correct password is typed in, the Full Lock is defeated.

To set Full Lock:

1. Type in the desired password of up to 8 letters, using the frequency keys.
2. The procedure can be aborted by pressing the **Exit** key.
3. Press the **Full** key.

Partial

Partial lock prevents access to all controls except for Memory Recall. After Partial Lock has been set, the only action possible is to Recall a memory (press the **Recall** key) or unlock the unit by pressing the **Unlock** key and typing in the correct password. If the correct password is typed in, the Partial Lock is defeated.

To set Partial Lock:

1. Type in the desired password of up to 8 letters, using the frequency keys.
2. The procedure can be aborted by pressing the **Exit** key.
3. Press the **Partial** key.

Exit

Soft key 4 is accompanied by the text **Exit**. Pressing this key returns the unit to the start-up menu.

More. . . Utilities menu

Accessed by pressing the **Utilities** key followed by the **More. . .** key.

Soft key options: **Slaves**

MIDI Chan

Inv LCD

Exit

Slaves

Soft key 1 is accompanied by the text **Slaves**. Pressing this key enables the selection of Slave devices to be addressed. Pressing this key also causes the DN3600 to assume the roll of Master over any connected DN3600/DN3601 units. Use the **FREQ** or **LEVEL** rotary control to cycle through the various options:

STAND ALONE

The normal mode of operation. All controls and adjustments affect only the one, local DN3600 unit. The DN3600 must always be returned to STAND ALONE mode in order to control itself.

ALL

All controls and adjustments affect all the compatible slave devices connected into the network, including the local, Master DN3600 unit.

Slaves 1 to 64

The Master/Slave mode of operation. Select a single slave device to address. When a slave is selected, all controls and adjustments affect that slave only. There are no changes to the local, master DN3600 unit. The DN3600 must be returned to STAND ALONE mode in order to control itself.

The procedure may be aborted at any time by pressing the **Exit** key.

Press the **Slaves** key a second time to complete the selection.

MIDI Chan

Soft key 2 is accompanied by the text **MIDI Chan**. Pressing this switch enables the selection of MIDI send and receive channels. By use of the **FREQ** or **LEVEL** rotary control, select either OMNI ON mode (receive all channels, send on channel 1) or OMNI OFF mode and one of MIDI channels 1 to 16.

The procedure may be aborted at any time by pressing the **Exit** key.

To complete the selection, press the **MIDI Chan** key a second time.

The DN3600 recognises MIDI program change messages 1 to 66 on its assigned channel, and maps them to recall memories 1 to 66.

Also, the DN3600 sends MIDI program change messages 1 to 66, mapped to memory recall commands entered via the front panel.

Inv LCD

Soft key 3 is accompanied by the text **Inv LCD**. When pressed, this switch toggles the LCD screen between Normal display (white or green characters and graphics on a blue screen) and Inverted display (blue characters and graphics on a white or green screen).

Exit

Soft key 4 is accompanied by the text **Exit**. When this switch is pressed, the unit returns to the start up menu.

DN3601 TECHNICAL SPECIFICATION

INPUTS

Type
Impedance (ohm)
Balanced
Unbalanced
Max. level

TWO

Balanced (electronically)

20k
10k
+22dBu

OUTPUTS

Type
Min. load impedance
Source impedance
Max. level

TWO

Balanced (electronically)
600ohm
50ohm
+22dB into >2kohms

PERFORMANCE

Frequency response /EQ flat
Distortion @ +4dBm
Equivalent input noise
(20Hz to 20kHz unweighted)
Overload indicator
Gain

+/-0.5dB (20Hz to 20kHz)
<0.02% @ 1kHz
< -94dBu
+19dBu
-18 to +6dB

FILTERS

Type
ISO Centre Frequencies
Tolerance
Maximum Boost/Cut
Step size
High pass filter slope
Step size
Low pass filter slope
Step size
Notch filters
Maximum cut
Step size

Revised MELT hybrid
30, 25Hz - 20kHz 1/3 Octave
+/-5%
12dB
1/2dB
12dB/Octave 20Hz - 400Hz
1/3 Octave
12dB/Octave 30kHz - 1.6kHz
1/3 Octave
Two per channel, varying Q
12dB
1/12 Octave and 1dB

POWER REQUIREMENTS

Voltage
Consumption

110/120/220/240v @ 50/60Hz AC
<35VA

DIMENSIONS

Width
Height
Depth

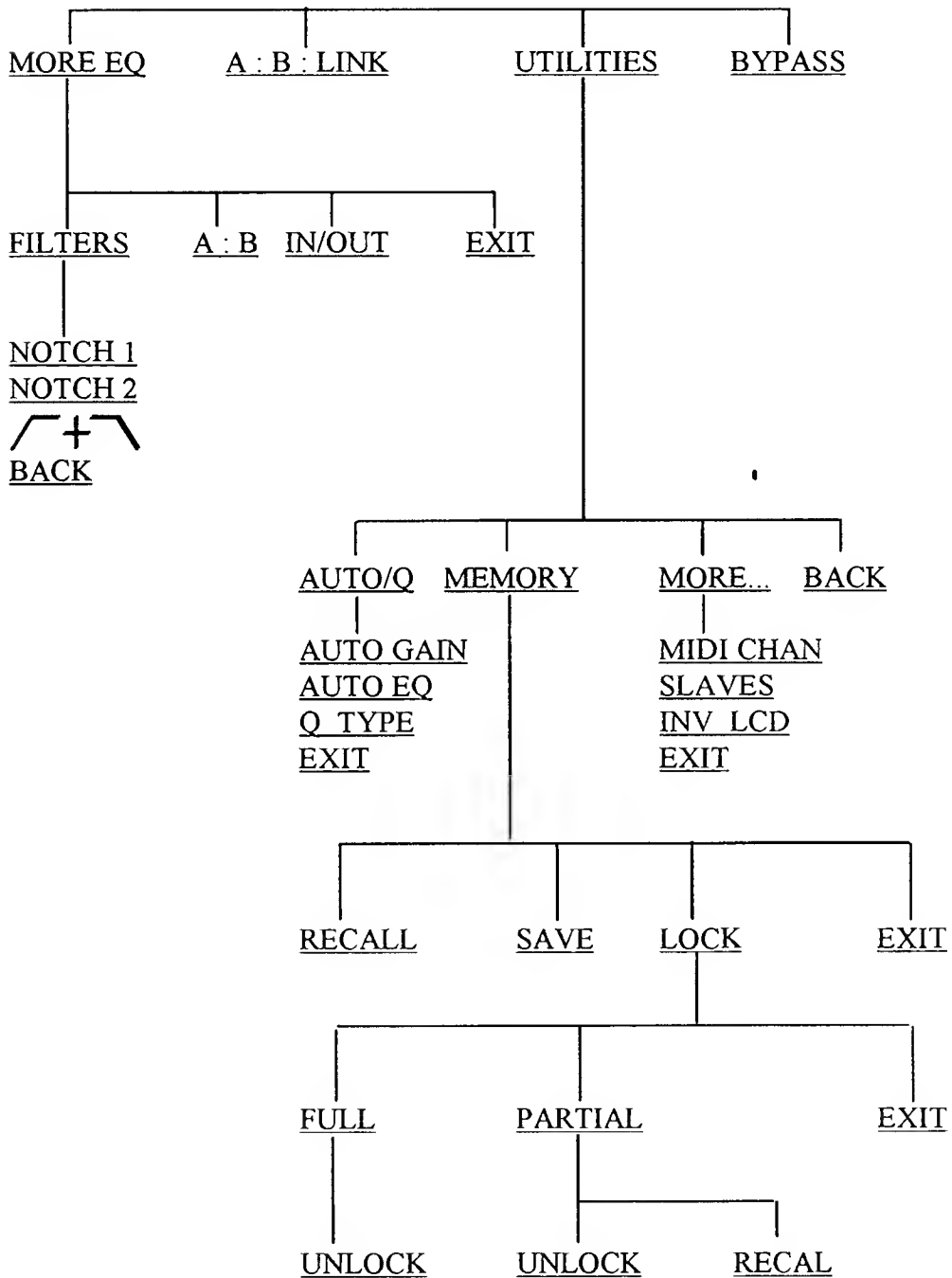
482mm (19 inches)
88mm (3.5 inches)
306mm (12.25 inches)

WEIGHT

Net
Shipping

8kg
11kg

DN3600 SOFTWARE V2.0 MENU STRUCTURE



Service Information

SERVICE INFORMATION

Servicing should only be carried out by a qualified service engineer. Klark Teknik PLC accepts no liability for damage or injury arising from incorrect servicing.

The unit may be set for 240v or 120v operation (50-60Hz) via a slide switch on the rear panel adjacent to the mains IEC inlet socket. Internal links can be moved to change the transformer tapping should a choice of 220v or 110v be preferred. Check that the unit is set to the correct voltage before applying power.

Fuse ratings:

Rear panel fuse holder: 500mAT

F2	-	800mAT
F3	-	800mAT
F4	-	1AT

MIDI Connections

DN3600 Pro MIDI XLRs correspond to standard MIDI 5-pin DIN connectors thus:

DIN			XLR		
Pin 5	-	data	-	Pin 3	
Pin 4	-	+5V	-	Pin 2	
Pin 2	-	GND	-	Pin 1	

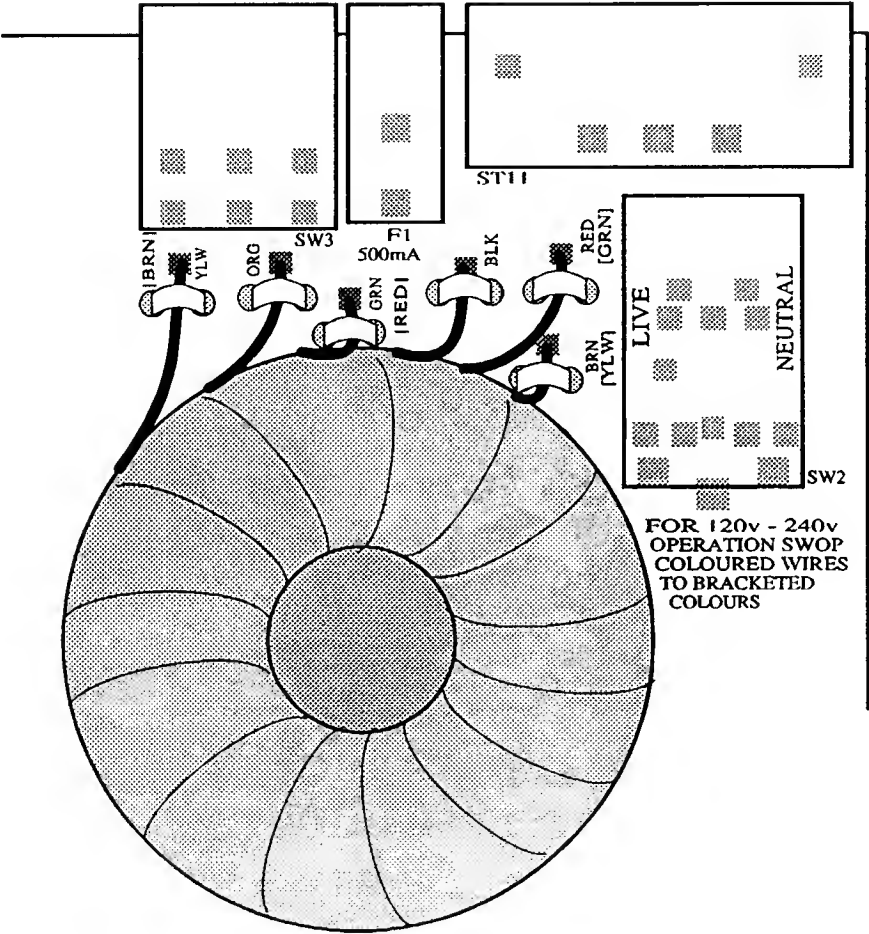
Voltage Change-Over

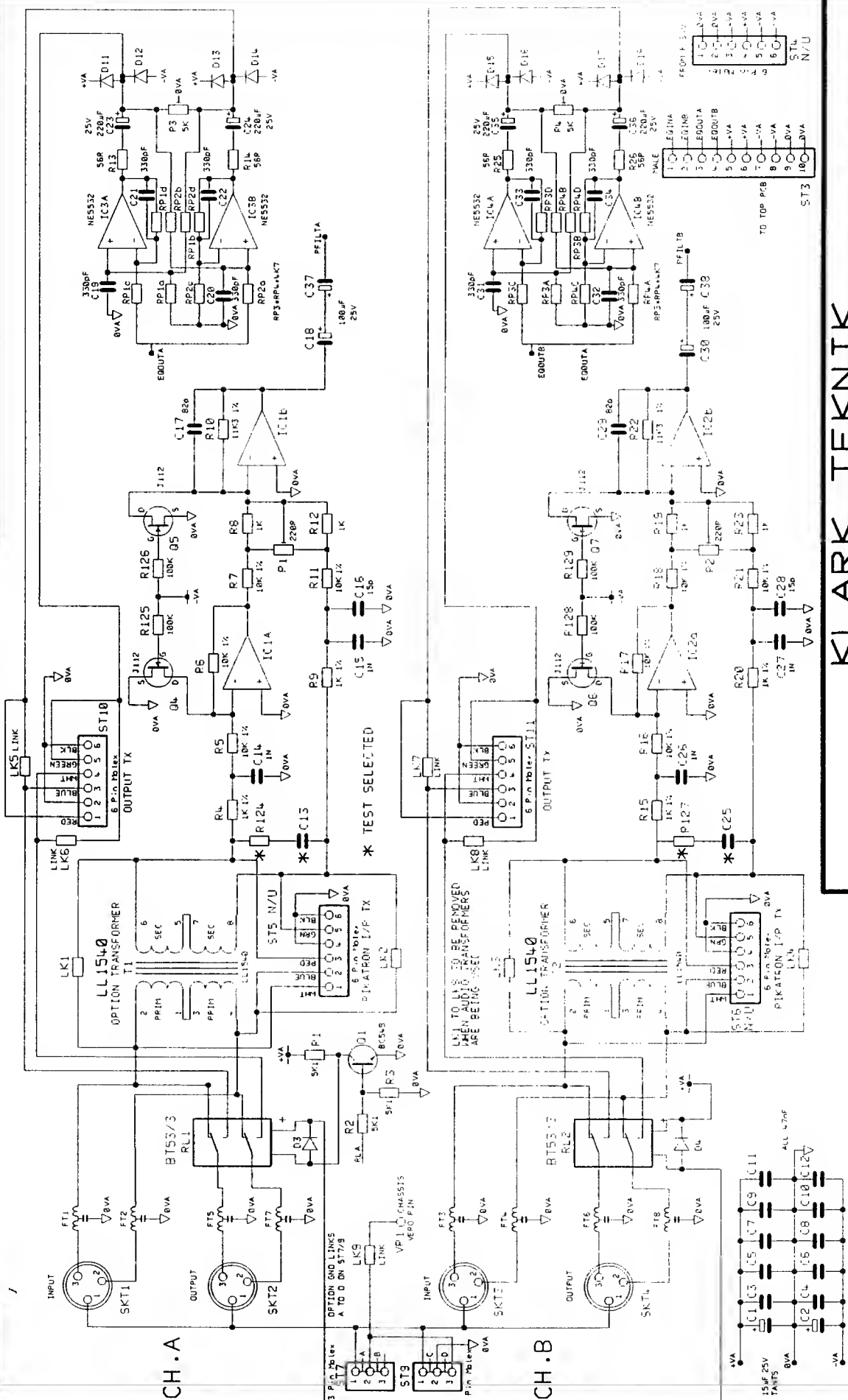
* NOTE: Noisy supply or insufficient mains voltage will cause the DN3600 to operate in noisy or intermittent manner.

The unit can be set to operate on 110/120 or 220/240 (nominal) VAC @ 50 or 60Hz, by changing the position of the voltage selector switch on the rear panel of the unit, adjacent to the mains power inlet, and by swapping wires soldered within the unit (see overleaf). The range of supply voltages suitable for each setting are as follows:-

Switch Position	Range
240V	215-250V @ 50Hz
220V	200-230V @ 50Hz
120V	105-130V @ 60Hz
110V	95-115V @ 60Hz

DETAIL OF MAINS VOLTAGE CHANGE OVER FOR ISSUE 4 MICROBOARDS.





KLARK TEKNIK

Drawn : T.K.G	Checked :	UNIT DN.3601	I/O STAGE	1 OF 14
BOARD No. 827581s3		DWG No. 3601_1.DGM	ISSUE : 1	DATE : 9.4.94

ALL CMOS? LINES
ARE CONNECTED TO ST8

ALL OPAMP'S NE5532
UNLESS OTHERWISE STATED
IC7.8.35 DG411

NOTCH 1

NOTCH 2

HIGH PASS

LOW PASS

I/P

O/P

KLARK TEKNIK

Drawn: T.K.G Checked: P.S.U

UNIT DN.3601

NOTCH/HIGH/LOW PASS CH.A

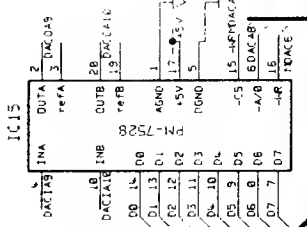
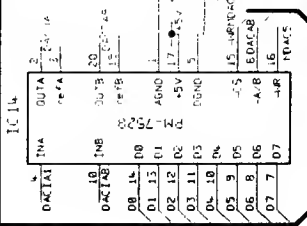
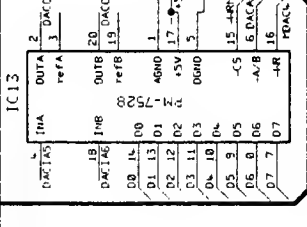
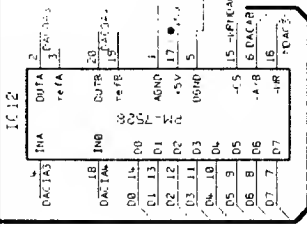
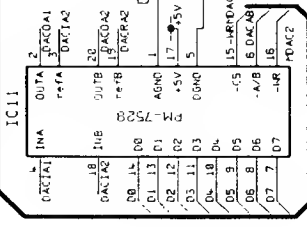
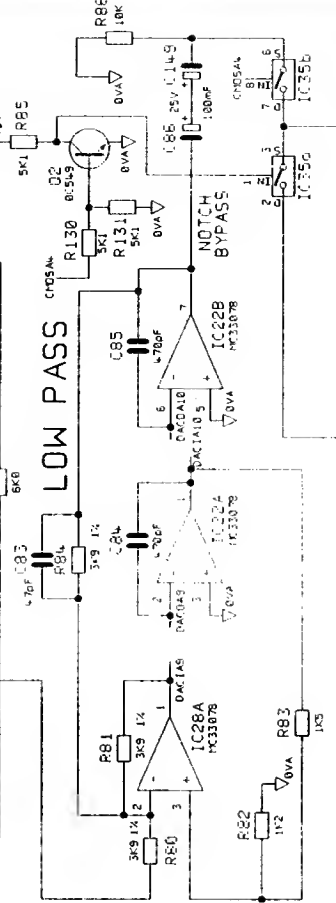
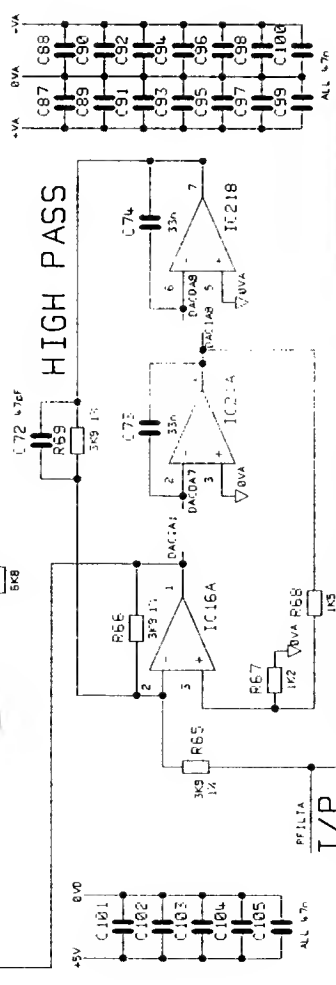
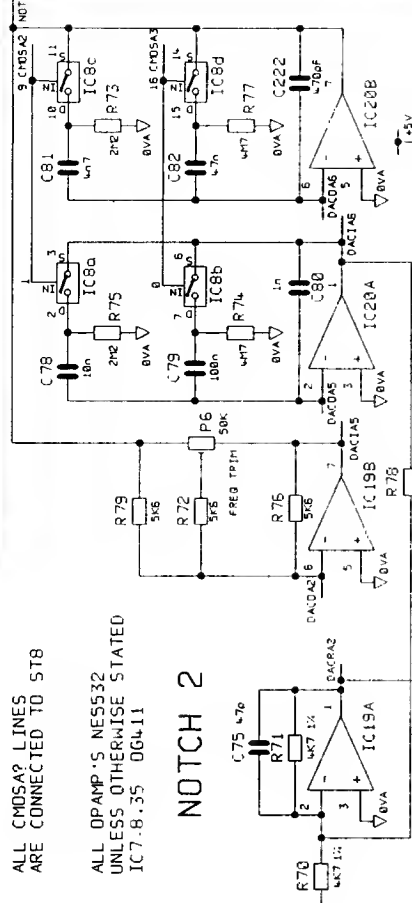
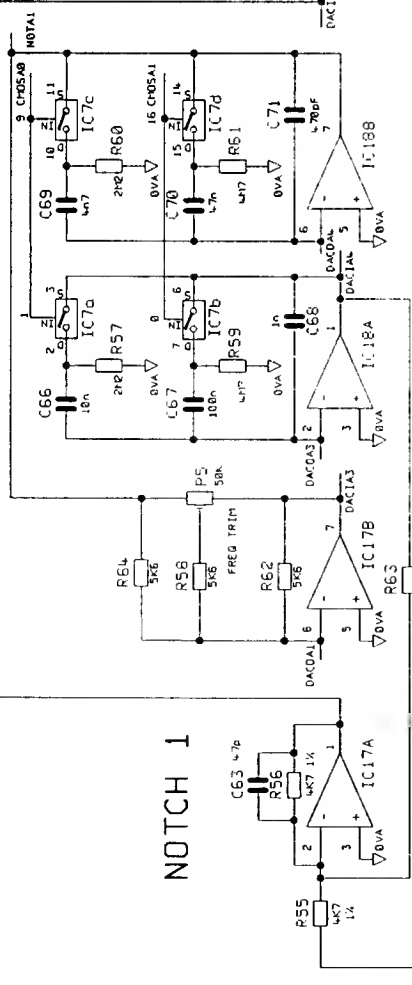
3 OF 14

BOARD No. B27581s3

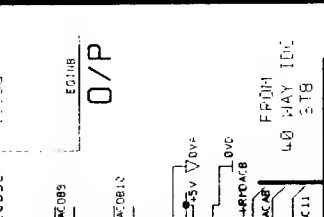
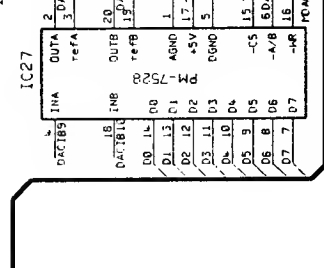
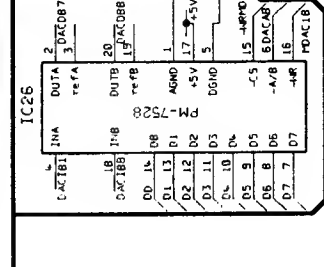
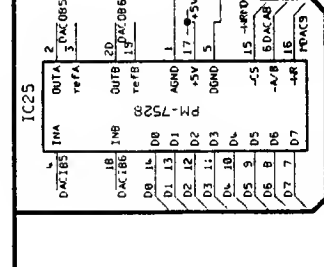
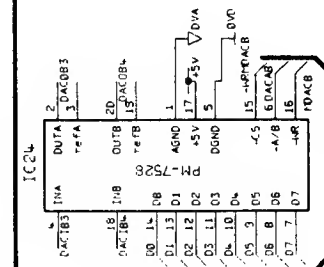
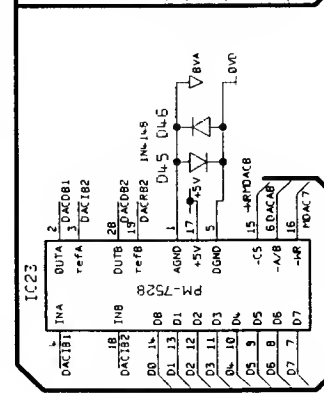
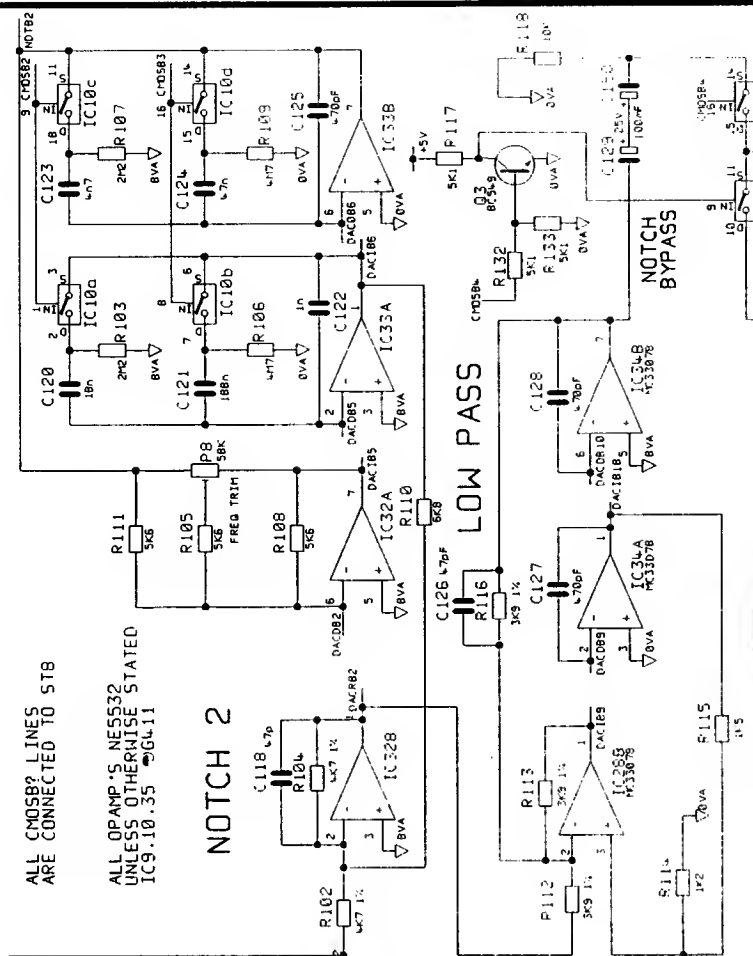
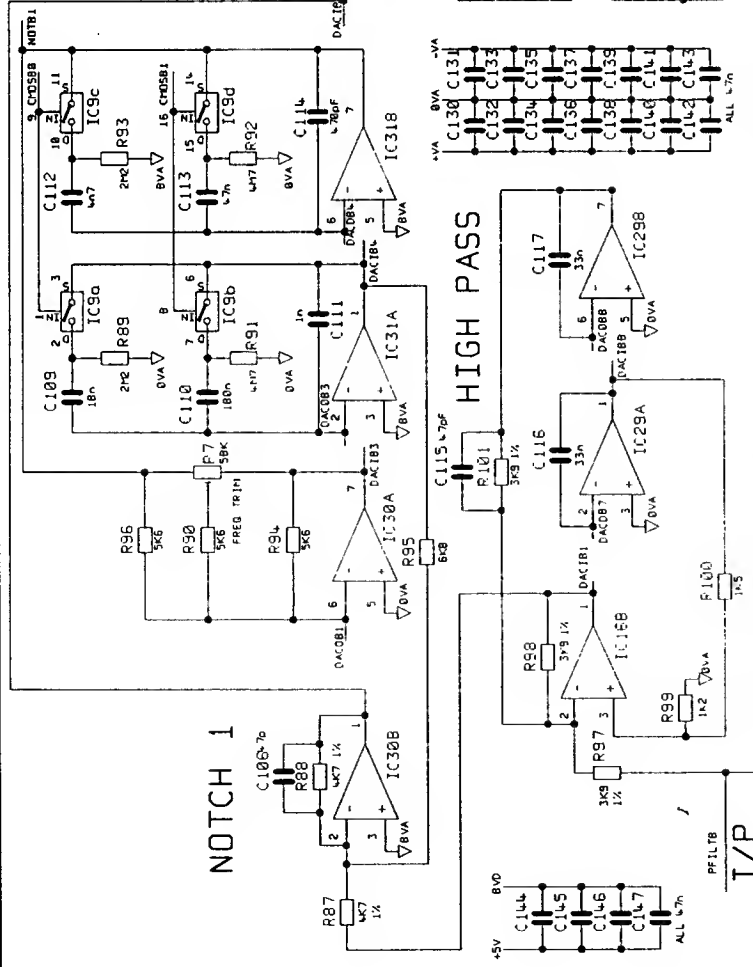
DWG No. 3601_3.DGM

ISSUE: 2

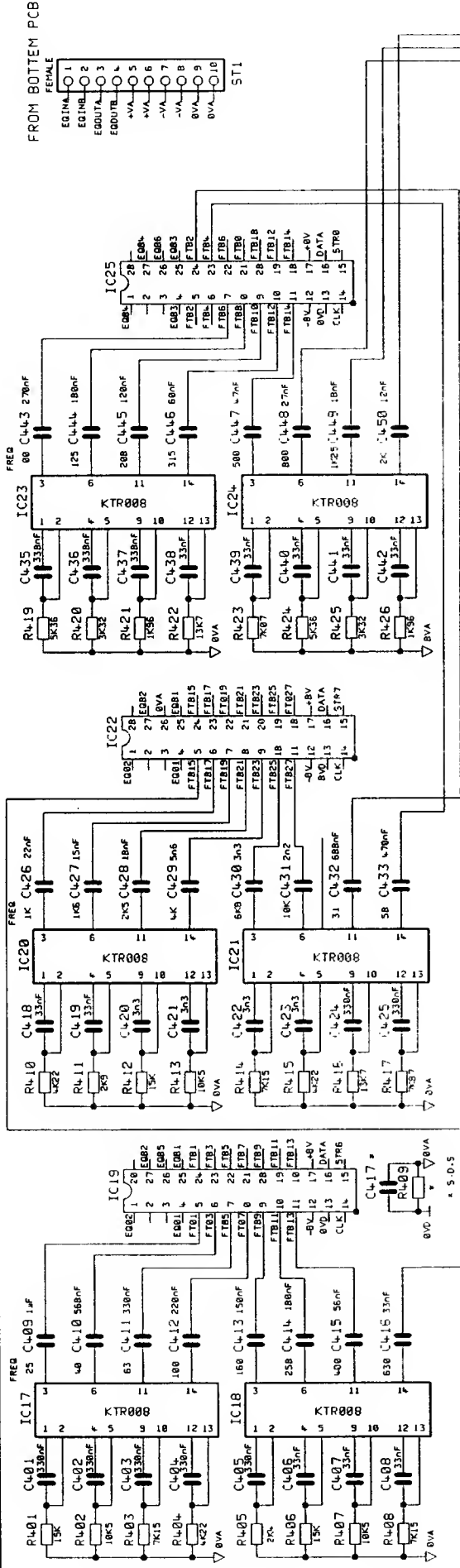
DATE: 10.8.94



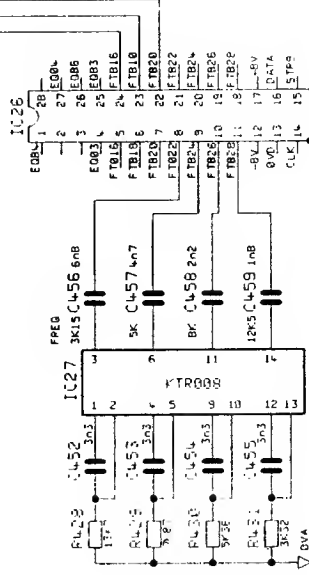
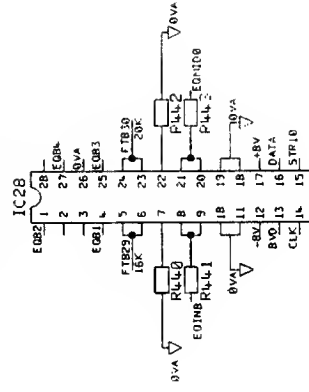
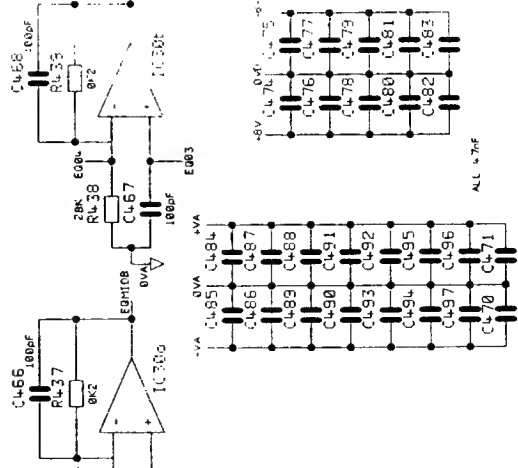
FROM
40 MAY 1994
ST8



KLARK TEKNIK



CH.B 16K/20K FILTERS
SHOWN ON 3601_5.DGM



KLARK TEKNIK

Drawn: T.K.G

Checked:

UNIT DN.3601

CH.B EQ.SECTION

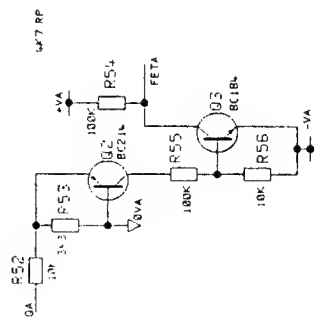
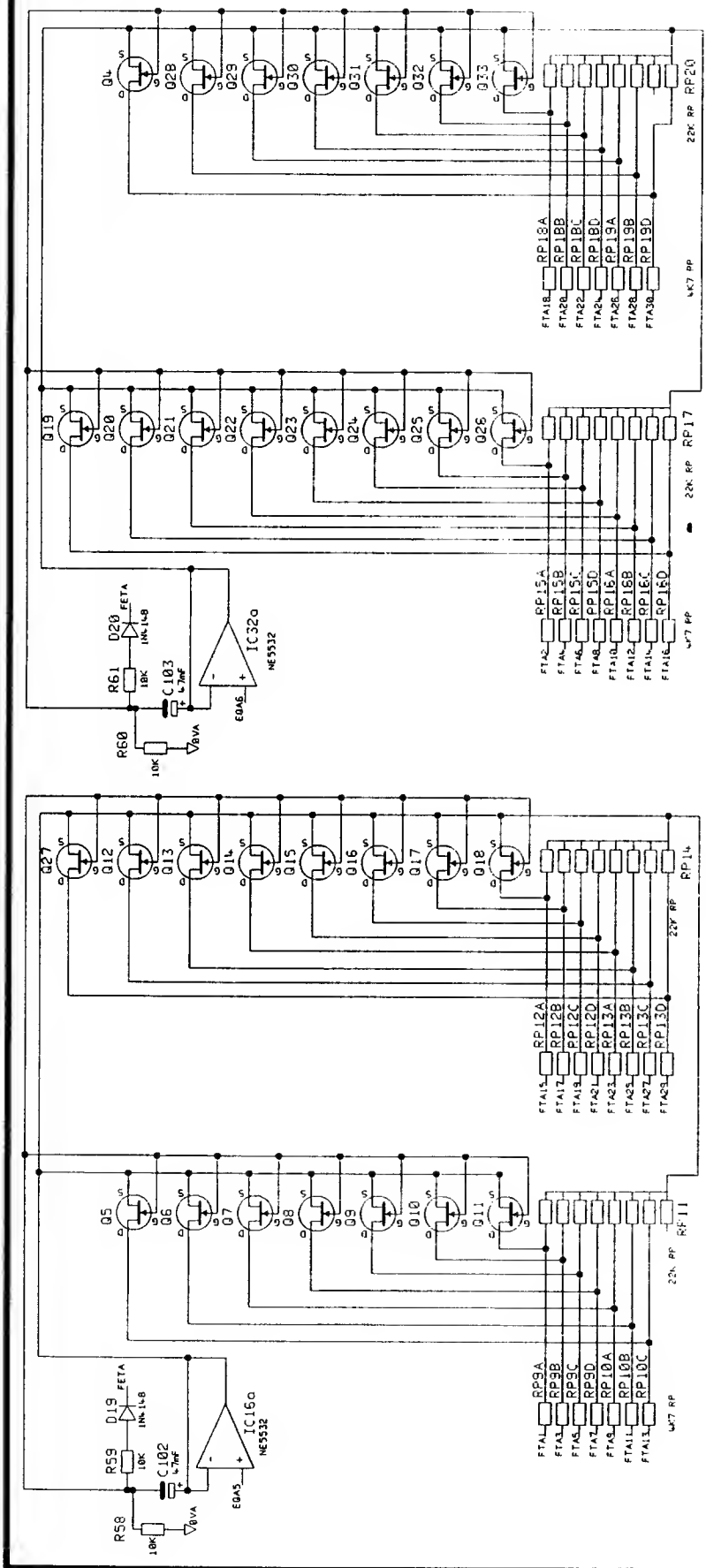
8 OF 14

BOARD No. B2757 is2

DWG No. 3601_6.DGM

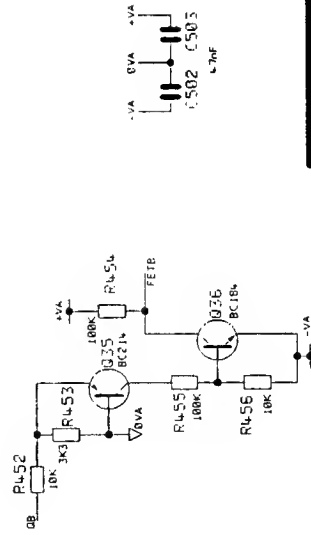
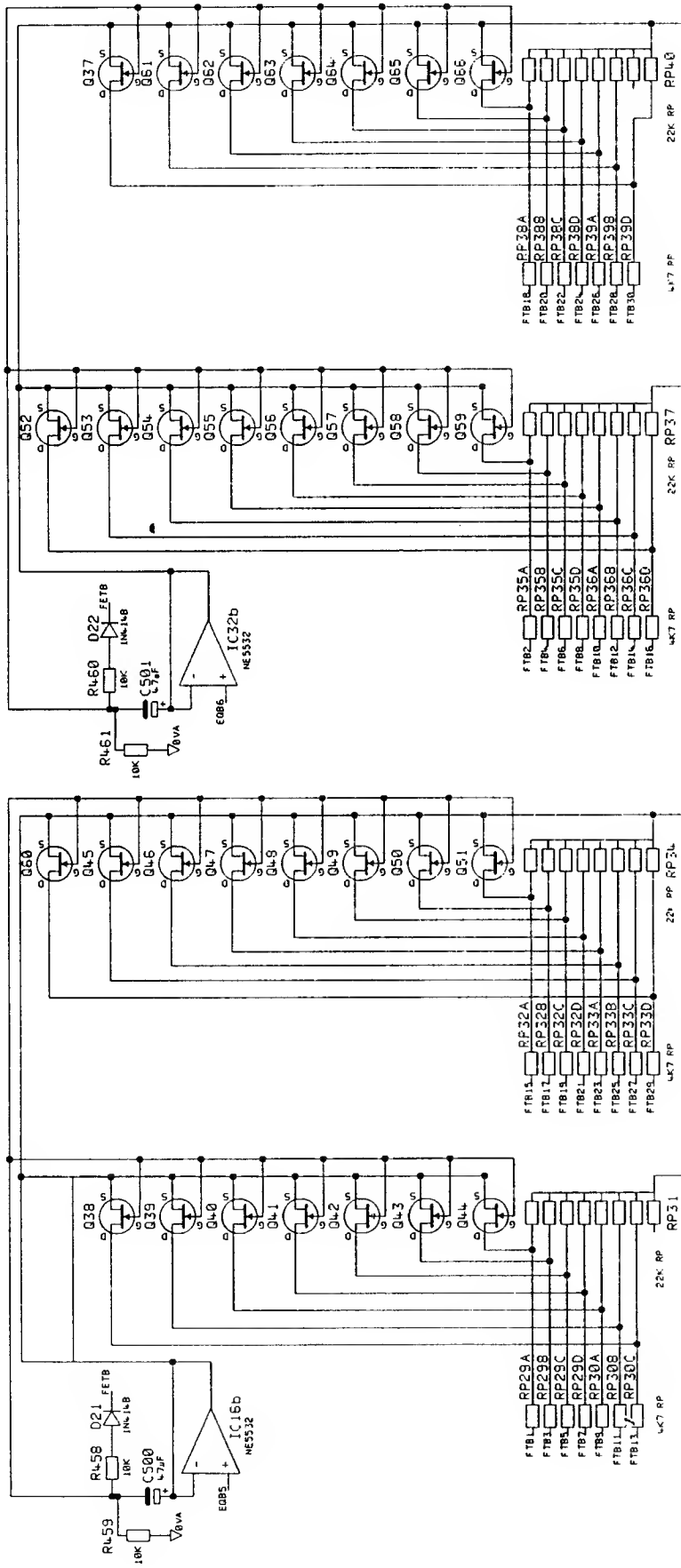
ISSUE: 1

DATE: 9.4.94



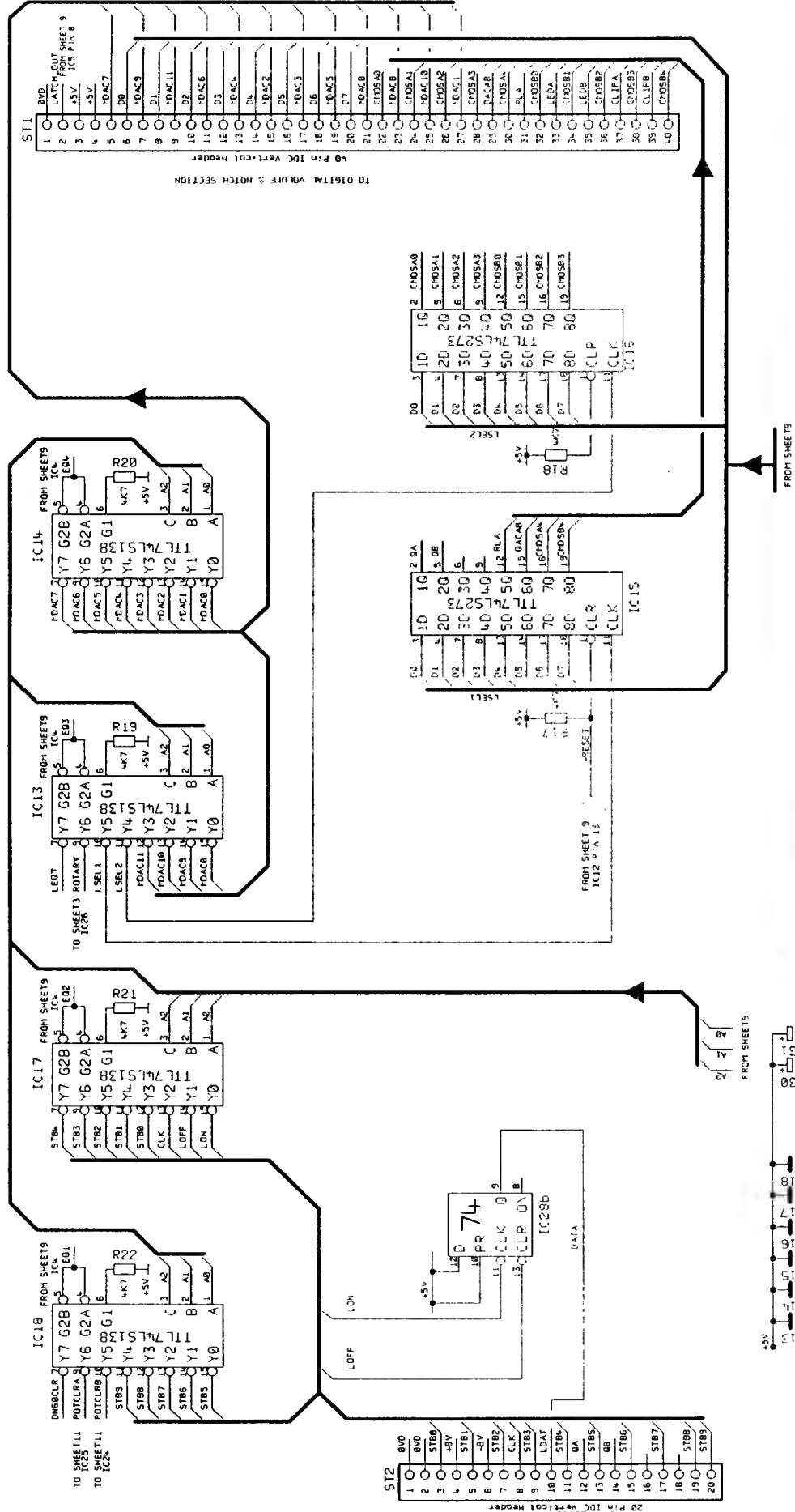
KLARK TEKNIK

Drawn : T.K.G	Checked :	UNIT DN .3601	Q CONTROL CH.A	7 OF 14
BOARD No. B2757is2		DWG No. 3601_7.DGM	ISSUE : 1	DATE : 9.4.94



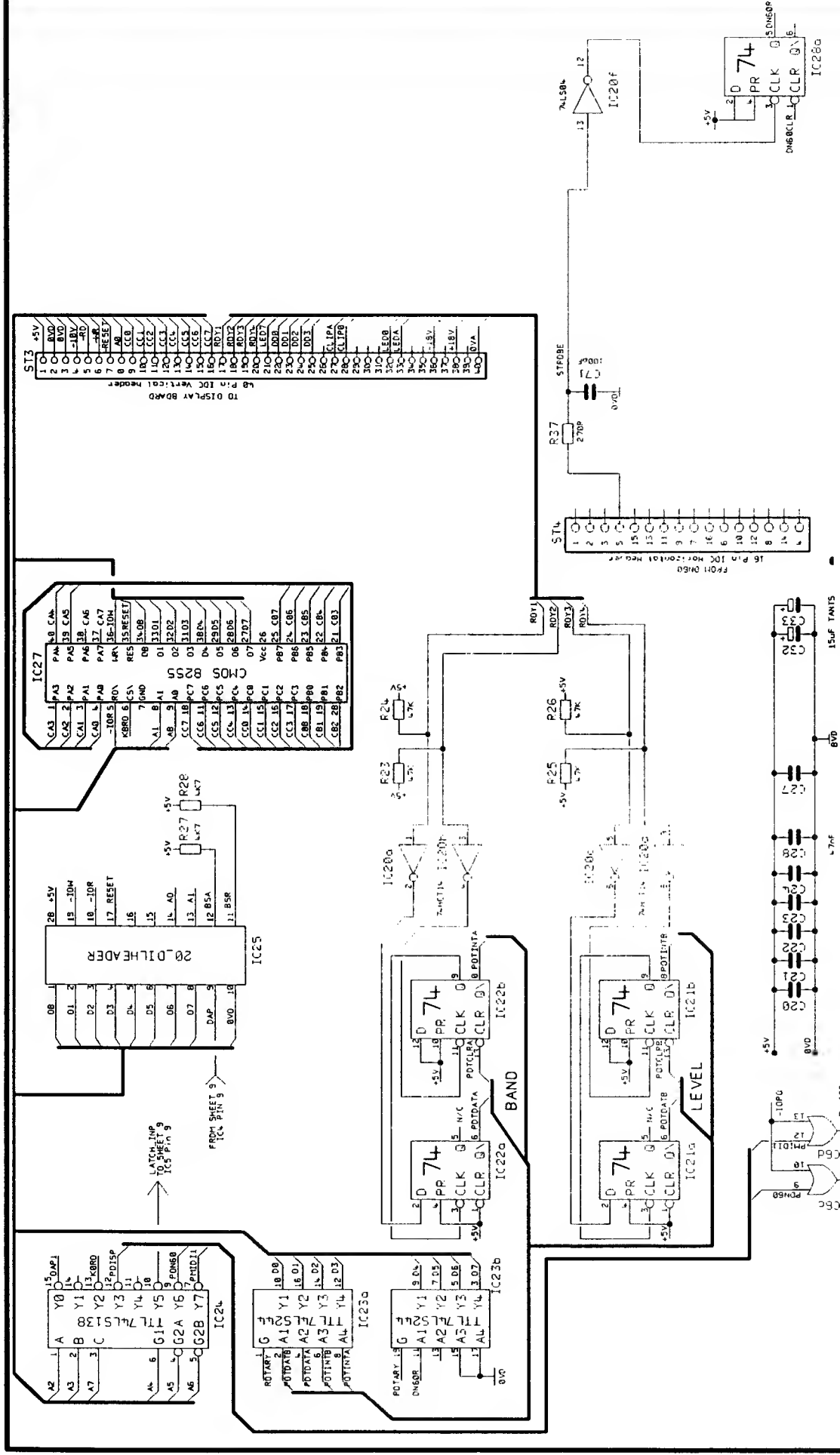
KLARK TEKNIK

Drawn: T.K.G	Checked:	UNIT DN.3601	Q CONTROL CH.B	8 OF 14
BOARD No. B2757is2		DWG No. 3601_8.DGM	ISSUE: 1	DATE: 9.4.94



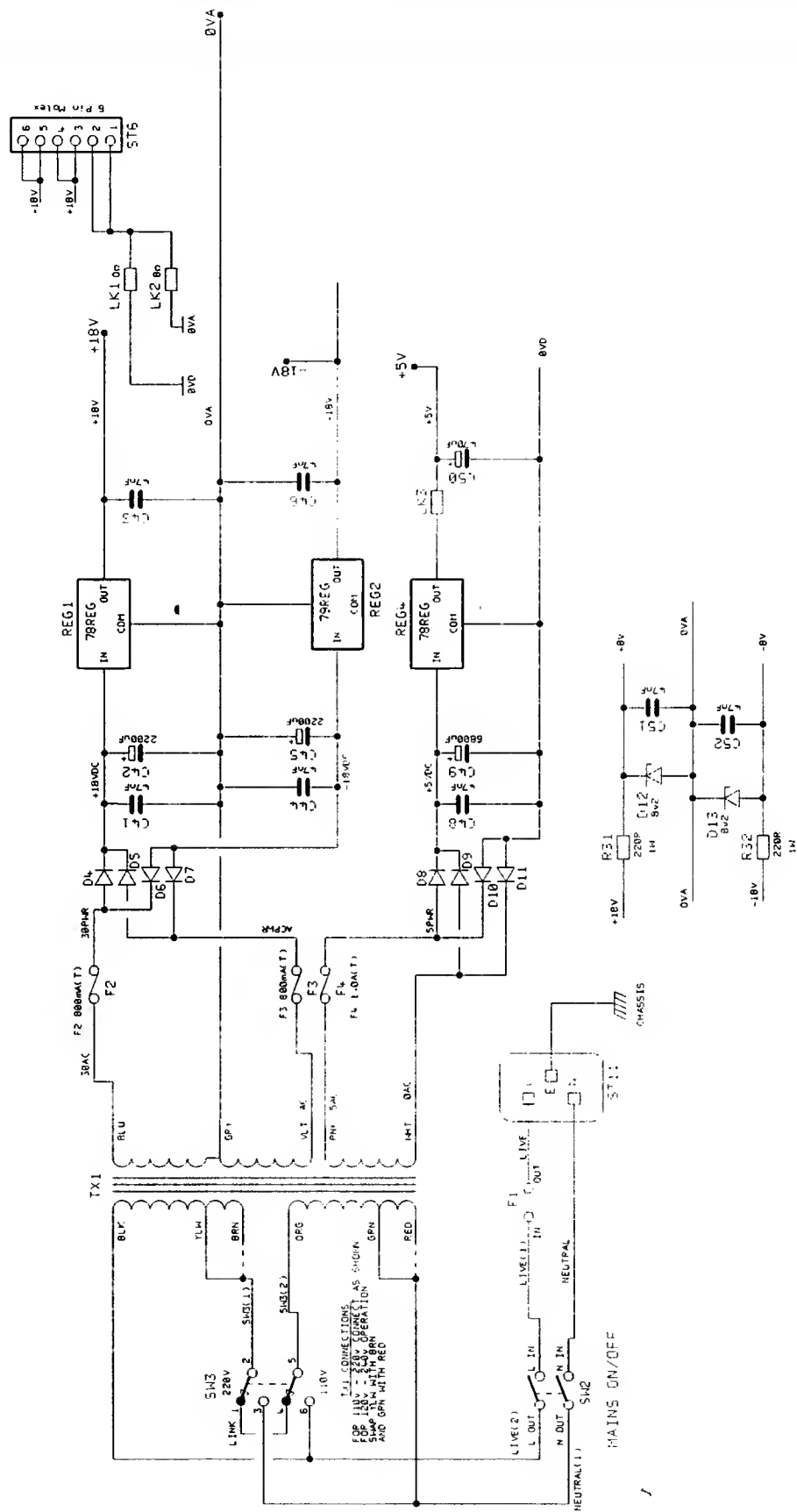
KLARK TEKNIK

Drawn : J.R.C	Checked :	UNIT DN.3601	ADDRESS DECODING	10 OF 14
BOARD No. B2752		DWG No. 3601_10.DGM	ISSUE: 4	DATE: 1 JUN 94



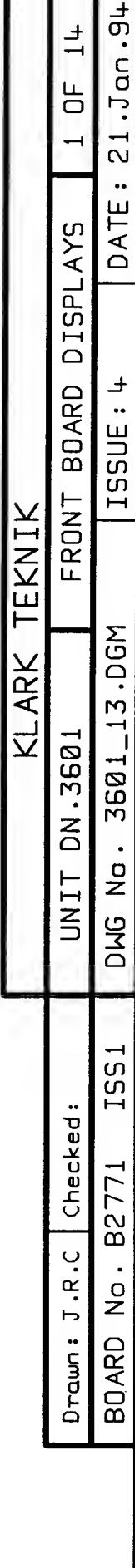
KLARK TEKNIK

Drawn: J.R.C	Checked:	UNIT DN.3601	MISC DIGITAL I/O	11 OF 14
BOARD No. B2752	DWG No. 3601-11.DGM	ISSUE: 4	DATE: 8 APR 94	

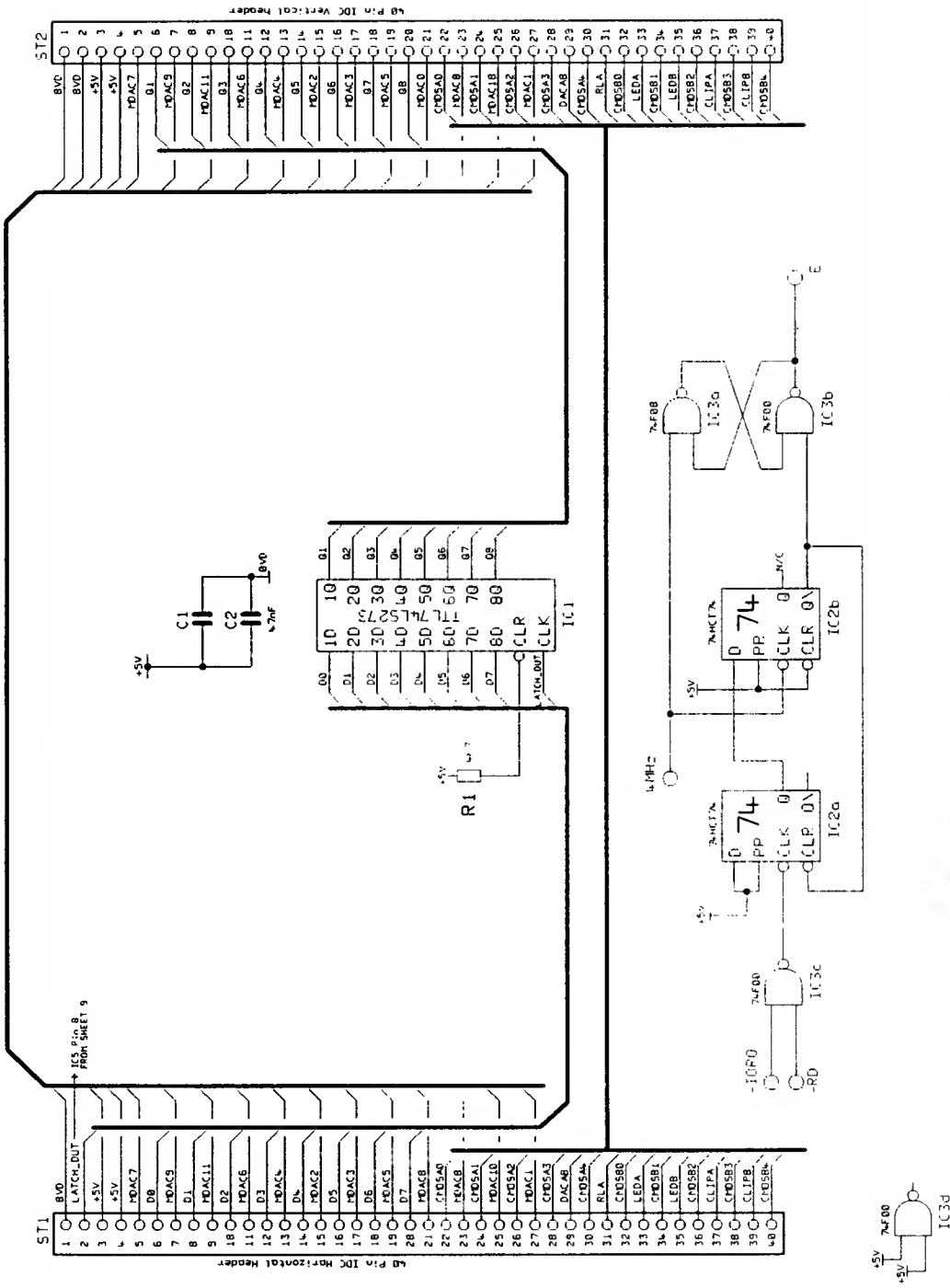


KLARK TEKNIK

Drawn: J.R.C	Checked:	UNIT DN.3601	POWER SUPPLY	12 OF 14
BOARD No. B2752		DWG No. 3601_12.DGM	ISSUE: 4	DATE: 8 APR 94



TO IO PCB



KLARK TEKNIK

LATCH & MIDI SUB BOARD

ISSUE: 2

12.11.93